

pg. 342 # 1-32 all

1. $5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$ (or use calculator)

$$\begin{array}{r} \checkmark \\ 20 \\ \checkmark \\ 60 \\ \checkmark \\ 120 \end{array}$$

9a. $4! = 24$

b. $5! = 120$

10. ${}_8P_1 = \frac{8!}{(8-1)!} = \frac{8 \cdot \cancel{7} \cdot \cancel{6} \cdot \cancel{5} \cdot \cancel{4} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{1}}{\cancel{7} \cdot \cancel{6} \cdot \cancel{5} \cdot \cancel{4} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{1}} = 8$

18. ${}_{15}P_{10}$ 15 students in order for 10 things
$$= \frac{15!}{(15-10)!} = \frac{15 \cdot 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5!}{5!}$$
$$= 10,897,286,400$$

21. ${}_6C_2 = \frac{6!}{2!(6-2)!} = \frac{6 \cdot 5 \cdot \cancel{4} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{1}}{2 \cdot 1 \cdot (\cancel{4} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{1})} = \frac{30}{2} = 15$

29. ${}_{16}C_{11} = \frac{16!}{11!(16-11)!} = \frac{16 \cdot 15 \cdot 14 \cdot 13 \cdot 12 \cdot \cancel{11} \cdot \cancel{10} \cdot \cancel{9} \cdot \cancel{8} \cdot \cancel{7} \cdot \cancel{6} \cdot \cancel{5}}{(\cancel{11} \cdot \cancel{10} \cdot \cancel{9} \cdot \cancel{8} \cdot \cancel{7} \cdot \cancel{6} \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1) (\cancel{5}!)}$
$$= \frac{16 \cdot 15 \cdot 14 \cdot 13 \cdot 12}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = \frac{524,160}{120} = 4368$$

31. ${}_{25}C_3 + {}_{25}C_2 = 2600$

Answers for Lesson 6-7, pp. 342–345 Exercises

1. 120

2. 3,628,800

3. 6,227,020,800

4. 720

5. 665,280

6. 120

7. 120

8. 3003

9. a. 24

b. 120

10. 8

11. 56

12. 336

13. 1680

14. 6

15. 120

16. 60,480

17. 60

18. 10,897,286,400

19. 4,151,347,200

20. 12

21. 15

22. 56

23. 1

24. 4

25. 35

26. 15

27. 35

28. $\frac{5}{18}$

29. 4368

30. 21

31. 2600

32. 126

33. true because of the Comm. Prop. of Add.

34. true because of the Assoc. Prop. of Mult.

35. False; answers may vary. Sample: $(3 + 2)! = 120$ and $3! + 2! = 8$

36. False; answers may vary. Sample: $(3 \times 2)! = 720$ and $3! \times 2! = 12$

37. False; answers may vary. Sample: $(3!)! = 720$ and $(3!)^2 = 36$

38. False; answers may vary. Sample: $(3!)^2 = 36$ and $3^{(2!)} = 9$

39. 3125

40. 60

41. 2 ways, because order matters

/ 33